



**CENTRE FOR NANOSCIENCE AND TECHNOLOGY
PONDICHERRY UNIVERSITY**

Invites You to the Lecture on

**“Thermal Spray Coatings: Fundamentals,
Properties and Applications”**

By

Dr. Anup Kumar Keshri

**Department of Metallurgy
Indian Institute of Technology – Patna**

Date: 06-09-2016


Time: 11.00 AM


Tea : 10.30 AM

Venue: Seminar Hall, Centre for Nanoscience and Technology

ALL ARE WELCOME


(Dr. A. Subramania)
(Centre Head)


(Dr. P. THANGADURAI)
(Seminar Co-ordinator)


Dr P. Thangadurai M.Sc., M.Phil., Ph.D.
Assistant Professor
Centre for Nanoscience and Technology
Pondicherry University, Kalapet
Puducherry-605 014

Thermal Spray Coatings: Fundamentals, Properties and Applications

Dr. Anup Kumar Keshri

Assistant Professor

Department of Materials Science and Engineering

Indian Institute of Technology, Patna

Amhara Road, Bihta, Pin: 801103, Bihar

Email: anup@iitp.ac.in, akesh001@fiu.edu

Thermal spraying is a group of processes (viz. *plasma spraying*, *high-velocity oxy fuel spraying*, and *cold spraying*, *Liquid precursor plasma spray*) in which finely divided metallic and nonmetallic materials are deposited in a molten or semi-molten state on a prepared substrate. A comparison of powder particle interaction with different energy/flame sources encountered during *different thermal spraying process* will be discussed. The properties of the thermal spray coatings are largely dependent on the splat morphology and their stacking. Incomplete melting and improper stacking of splats can result in globular voids, poor adhesion at the inter-splat boundary which can have adverse effect on the mechanical, thermal and electrical properties of the coatings. Hence splat formation and its morphology play a significant role in tailoring the coating properties. An in-depth analysis will be presented on the plasma sprayed splat formation and morphology for the different composition of the powder.

Formation and morphology of the splats can be manipulated by optimizing the plasma spray process parameters. Plasma spraying involves myriad of process, equipment and powder parameters which has a direct effect on the splat morphology and ultimately affects the coating properties. Comprehensive process maps correlating the key plasma processing parameters to the temperature and velocity of the in-flight particles and ultimately, its impact on the splat morphology and coating properties will be shown. Finally, the potential applications of plasma sprayed nanomaterials as coatings and bulk materials for several functional applications will be presented. The main objective is to introduce and familiarize the audience with myriad applications and potentials of plasma spraying technique for nanomaterials. Though plasma sprayed deposits exhibit great potential for these applications, there are major challenges experienced during plasma processing of nanomaterials, which will be understood.

Dr P. Thangadurai
30/08/2016

